IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellant:	Ronald D. McCallister	**Appeal Brief**
Serial No.	10/718,505	
Filing Date	11/20/2003	
Group Art Unit	2611	
Examiner	Jean B Corrielus	
Attorney Docket No.	125.136USR1	
Title: CONSTRAINED-ENVELOPE TRANSMITTER AND METHOD THEREFOR		

On June 25, 2008, Appellants filed a notice of appeal from the last decision of the Examiner mailed March 25, 2008. This Appeal Brief is accompanied by a fee in the amount of $ 510.00 as required under 37 C.F.R. §1.17(c).

1. **Real party in interest**

The real party in interest in the above-captioned application is the assignee Intersil Americas, Inc.

2. **Related appeals and interferences**

There are no other appeals or interferences known to the Appellants that will have a bearing on the Board's decision in the present appeal.

3. **Status of claims**

Claims **2-11 and 13-23** were rejected in the Final Office Action mailed March 25, 2008. Claims **1 and 12** were cancelled previously. The rejections of claims **2-11 and 13-23** are the subject of the present appeal.

4. **Status of amendments**

No amendment has been filed subsequent to the Office Action mailed March 25, 2008.

5. **Summary of claimed subject matter**

Pursuant to 37 C.F.R. §41.37(c)(1)(v), Appellant provides the following concise explanation of the subject matter defined in each independent claim with reference to the specification by page and line number and to the drawings by reference number. Appellant submits that the citations to the specification and drawings are not intended to be exhaustive and that other support for the various claims may also be found throughout the specification and drawings.

A. Claim 2

A constrained-envelope digital communications transmitter circuit is claimed in claim 2 of this application. The circuit of claim 2 includes a modulated-signal generator (77; Fig. 2) for generating a first modulated signal conveying to-be-communicated data (74; Col. 7, lines 7-14), having a first bandwidth and having a first peak-to-average amplitude ratio (Col. 9, lines 27-45). The circuit of claim 2 also includes a constrained-envelope generator (106, 106' of Fig. 2) for generating a constrained bandwidth error signal (108, 108') in response to said first modulated signal (Col. 9, line 46 to Col. 10, line 51). The circuit of claim 2 also includes a combining circuit (110) for combining said constrained bandwidth error signal with said first modulated signal to produce a second modulated signal conveying said to-be-communicated data (112), said second modulated signal having substantially said first bandwidth (Col. 11, lines 55-67) and a second peak-to-average amplitude ratio, said second peak-to-average amplitude ratio being less than said first peak-to average amplitude ratio (Col. 9, lines 45-65). Further, the circuit of claim 2 includes a substantially linear amplifier (146) configured to amplify said second modulated signal (Col. 14, lines 4-17). Finally, the circuit of claim 2 includes a delay element (138) coupled between said modulated-signal generator and said combining circuit to delay said first modulated signal into synchronism with said constrained bandwidth error signal (Col. 11, lines 46-54).

B. Claim 6

A constrained-envelope digital communications transmitter circuit is claimed in claim 6 of this application. The circuit of claim 6 includes a modulated-signal generator (77; Fig. 2) for generating a first modulated signal conveying to-be-communicated data (74; Col. 7, lines 7-14), having a first bandwidth and having a first peak-to-average amplitude ratio (Col. 9, lines 27-45). The circuit of claim 6 also includes a constrained-envelope generator (106, 106' of Fig. 2) for generating a constrained bandwidth error signal (108, 108') in response to said first modulated signal (Col. 9, line 46 to Col. 10, line 51). The circuit of claim 6 also includes a combining circuit (110) for combining said constrained bandwidth error signal with said first modulated signal to produce a second modulated signal conveying said to-be-communicated data (112), said second modulated signal having substantially said first bandwidth (Col. 11, lines 55-67) and a second peak-to-average amplitude ratio, said second peak-to-average amplitude ratio being less than said first peak-to average amplitude ratio (Col. 9, lines 45-65). The circuit of claim 6 also includes a substantially linear amplifier (146) configured to amplify said second modulated signal (Col. 14, lines 4-17). Finally, the modulated-signal generator of claim 6 is a code division multiple access (CDMA) modulator and said first modulated signal conveys a plurality of code-channels of said to-be-communicated data (Fig. 8; 77'; Col. 14, line 37 to Col. 15, line 38).

C. Claim 14

Claim 14 is directed to a method for transmitting a constrained-envelope communications signal in a digital communications system. The method of claim 14 includes generating a first modulated signal conveying to-be-communicated data (74; Col. 7, lines 7-14) and having a first bandwidth and a first peak-to-average amplitude ratio (Col. 9, lines 27-45). The method also includes generating a constrained bandwidth error signal (108, 108') in response to said first modulated signal (Col. 9, line 46 to Col. 10, line 51). The method further includes combining said constrained bandwidth error signal with said first modulated signal to produce a second modulated signal conveying said to-be-communicated data (112), said second modulated signal having substantially

said first bandwidth (Col. 11, lines 55-67) and a second peak-to-average amplitude ratio, said second peak-to-average amplitude ratio being less than said first peak-to-average amplitude ratio (Col. 9, lines 45-65). The method further includes linearly amplifying said second modulated signal (146; Col. 14, lines 4-17). Finally, the method includes delaying said first modulated signal into synchronism with said constrained bandwidth error signal (138; Col. 11, lines 46-54).

D. Claim 17

Claim 17 of the present application is directed to a method for transmitting a constrained-envelope communications signal in a digital communications system. The method of claim 17 includes generating a first modulated signal conveying to-be-communicated data (74; Col. 7, lines 7-14) and having a first bandwidth and a first peak-to-average amplitude ratio (Col. 9, lines 27-45). Claim 17 further calls for The method also includes generating a constrained bandwidth error signal (108, 108') in response to said first modulated signal (Col. 9, line 46 to Col. 10, line 51). Claim 17 further calls for combining said constrained bandwidth error signal with said first modulated signal to produce a second modulated signal conveying said to-be-communicated data (112), said second modulated signal having substantially said first bandwidth (Col. 11, lines 55-67) and a second peak-to-average amplitude ratio, said second peak-to-average amplitude ratio being less than said first peak-to-average amplitude ratio (Col. 9, lines 45-65). Claim 17 further calls for linearly amplifying said second modulated signal (146; Col. 14, lines 4-17). Claim 17 further calls for the first-modulated-signal-generating activity to configure said first modulated signal as a code division multiple access (CDMA) signal conveying a plurality of code-channels of said to-be-communicated data (Fig. 8; 77'; Col. 14, line 37 to Col. 15, line 38).

E. Claim 18

Claim 18 is directed to a constrained-envelope digital communications transmitter circuit. The circuit of claim 18 includes a modulated-signal generator (77; Fig. 2) for generating a first modulated signal conveying to-be-communicated data (74; Col. 7, lines

7-14), having a first bandwidth and having a first peak-to-average amplitude ratio (Col. 9, lines 27-45). The circuit of claim 18 also includes a constrained-envelope generator (106, 106' of Fig. 2) for generating a constrained bandwidth error signal (108, 108') in response to said first modulated signal, said constrained bandwidth error signal exhibiting a bandwidth substantially equal to or less than said first bandwidth, and said constrained bandwidth error signal exhibiting peak amplitudes which are responsive to amounts by which magnitudes of said first modulated signal exceed a threshold (Col. 9, line 46 to Col. 11, line 5). The circuit of claim 18 also includes a delay element (138) for delaying said first modulated signal into synchronism with said constrained bandwidth error signal (Col. 11, lines 46-54). The circuit of claim 18 also includes a combing circuit (110) for combining said constrained bandwidth error signal with said first modulated signal to produce a second modulated signal conveying said to-be-communicated data (112), said second modulated signal having substantially said first bandwidth (Col. 11, lines 55-67) and a second peak-to-average amplitude ratio, said second peak-to-average amplitude ratio being less than said first peak-to average amplitude ratio (Col. 9, lines 45-65). Finally, the circuit of claim 18 also includes a substantially linear amplifier (146) configured to amplify said second modulated signal (Col. 14, lines 4-17).

6. **Grounds of rejection to be reviewed on appeal**

Whether claims the specification provides a written description of the limitation "fixed delay" to support claims **21-23**?

Whether claims **2-5, 8-11, 13-16, 18, and 20-23** are anticipated under 35 U.S.C. §102(a) as being anticipated by May?

Whether claims **6, 7, 17, and 19** are obvious under 35 U.S.C. §103(a) based on May in view of Hedberg?

7. Argument

A. Rejection of claims under 35 U.S.C. §112

i. The Applicable Law

35 U.S.C. § 112, first paragraph provides in relevant part:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The fundamental factual inquiry behind a rejection based on insufficient written description is whether the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, applicant was in possession of the invention as now claimed. *See, e.g., Vas-Cath, Inc. v. Mahurkar,* 935 F.2d 1555, 1562-63 (Fed.Cir. 1991). "Although [the applicant] does not have to describe exactly the subject matter claimed . . . the description must clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." *See, Id.* (*citing In re Gosteli*, 872 F.2d 1008, 1012 (Fed.Cir.1989))"

An applicant shows possession "by such descriptive means as words, structures, figures, diagrams, formulas, etc., that fully set forth the claimed invention." *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572 (Fed.Cir. 997). A written description does not need to describe the claimed subject matter in exactly the same terms as used in the claims. *Id.* (*citing Eiselstein v. Frank*, 52 F.3d 1035, 1038, (Fed.Cir.1995)).

ii. Rejection of claims 21-23 for lack of written description

Claims 21-23 were rejected under 35 USC § 112, first paragraph as failing to comply with the written description requirement. Specifically, the Examiner asserts that the specification fails to support the term "fixed delay" as used in claim 21. Appellant respectfully traverses this assertion.

The present application describes the delay at least at Col. 11, lines 46-54. This passage explains the function of the delay as follows:

> Modulated signal 74 is also passed to the input of a delay element 138. Delay element 138 produces delayed modulated signal 140, which is effectively modulated signal 74 delayed sufficiently to compensate for the propagation and other delays encountered in off-time constrained-envelope generator 106, and particularly in off-time pulse-spreading filter 134. In other words, delayed modulated signal 140 is modulated signal 74 delayed into synchronism with off-time constrained-bandwidth error signal stream 108.

Appellant respectfully asserts that one of ordinary skill in the art would understand this passage to describe a fixed delay. One of ordinary skill in the art would understand that a fixed delay would synchronize the signal streams 74 and 184 at combiner 110 as the fixed delay would compensate for the fixed propagation and other delays in the constrained-envelope generator 106. Therefore, the application meets the written description requirement to support the "fixed delay" limitation of the claim. Reversal of the rejection is respectfully requested.

B. Rejection of claims under 35 U.S.C. §102(a).

i. The Applicable Law

35 U.S.C. § 102 provides in relevant part:

A person shall be entitled to a patent unless-

> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent.

A claim is anticipated under 354 U.S.C. § 102 only if each and every element as set forth in the claim is found, either expressly or inherently, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051,1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the...claim." *Richardson v. Suzuki Motor Co.* 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but identical terminology is not required. *In re Bond*, 910 F. 2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990).

Anticipation focuses on whether a claim reads on a product or process disclosed in a prior art reference, not on what the reference broadly teaches. *Kalman v. Kimberly-Clark Corp.,* 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983). To anticipate a cliam, a reference must disclose every element of the challenged claim and enable one skilled in the art to make the anticipating subject matter. *PPG Industries, Inc. v. Guardian Industries Corp.,* 75 F.3d 1558, 37 U.S.P.Q. 2d 1618 (Fed Cir. 1996)

ii. Rejection of claims 2-5, 8-11, 13-16, 18, and 20-23

Claims 2-5, 8-11, 13-16, 18, and 20-23 were rejected under 35 USC § 102(a) as being anticipated by May. Appellant respectfully traverses this rejection.

a. May does not teach the delay limitation

Independent claims 2, 14, and 18 each include a "delay" limitation. For example, claim 2 specifies:

> a delay element coupled between said modulated-signal generator and said combining circuit to delay said first modulated signal into synchronism with said constrained bandwidth error signal.

Further, claim 14 specifies:

> delaying said first modulated signal into synchronism with said constrained bandwidth error signal.

Finally, claim 18 calls for:

> a delay element for delaying said first modulated signal into synchronism with said constrained bandwidth error signal.

Appellant respectfully asserts that May does not meet these limitations.

The Examiner has determined that the delay limitation is inherent in May. For example, in commenting on claim 2, the Examiner stated:

> In addition, as noted in the inventor submission filed on 7/5/05, a delay coupled between said modulated signal generator and said combining circuit to delay said first modulated signal into synchronism with said constrained bandwidth error signal, is inherent.[1]

[1] It may seem unusual that the inventor asserts that the prior art inherently teaches a limitation of the claimed invention. However, as explained in more detail below, the inventor took this position at a time when he was no longer employed by the Assignee. Further, the inventor had indicated to the assignee that

Final Office Action, p. 2, lines 10-13. Further, in the Response to Arguments Section of the Final Office Action, the Examiner states that "it is the examiner's position that a delay in [the] May reference has to be present." Final Office Action, p. 7, lines 4-5. Appellant respectfully traverses these assertions.

In the cited submission, the inventor states:

> The May paper teaches that you must identify the instant in time in which a signal peak occurs, and then subtract a scaled version of a fixed pulse-shape from the input signal, where the peaks of the pulse- shape and the signal have been time-aligned. <u>Since the pulse-shape extends in both directions in time from the point at which its peak occurs, the teaching clearly requires that the input signal is delayed by at least half of the pulse-shape duration. In view of the foregoing, it is clear that May's approach inherently uses a delay</u>; in my opinion it cannot be done any other way.

McCallister I, p. 1, lines 12-17. Appellant respectfully disagrees with this and other opinions expressed in the Inventor's Submission.

As an initial matter, Appellant notes that the inventor did not assert that *one of ordinary skill in the art* would read May this way. Rather, Mr. McCallister gave his opinion, as an expert/inventor, that he would read it this way. It is understandable that Mr. McCallister would read May to require the delay element because, as an inventor, Mr. McCallister exercised more than ordinary creativity to discover and understand the need for the delay in his own work. Appellant respectfully submits that Mr. McCallister's submission does not shed any light on how *one of ordinary skill in the art* would read May due to his expert knowledge and his inventive insights in his own work. Further, as discussed below, Mr. McCallister, at the time this declaration was submitted, was tainted by his own interest in having the claims found unpatentable or being forced to be narrowed.

As to the substance of Mr. McCallister's assertion, Appellant respectfully asserts that even if May inherently disclosed "that the input signal is delayed by at least half of the pulse shape duration," which it does not, May would not enable one of ordinary skill in the art to carry out the claimed invention. Thus, even if the Examiner is correct that "a

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he would like the freedom to practice his invention. Thus, the inventor had an interest in seeing that this application is denied, or at least substantially narrowed, at the time this statement was made.

delay in [] May . . . has to be present," this does not mean that May enabled the delay for one of ordinary skill in the art.

During prosecution, Appellant produced two declarations from a noted expert, Dr. Neil Birch,[2] to help establish a factual basis for analyzing the teachings of May. Hereinafter these declarations, dated May 2006 and June 2007, respectively, will be referred to as Birch I and Birch II. Based on the Birch I and Birch II declarations, Appellant has established that May does not disclose how to delay "the input signal." Further, May does not disclose how to time-align the scaled band-limited pulse-shape "so that the pulse peak and the signal peak are time-coincident." In fact, the alleged delay in May to make "the pulse peak and the signal peak . . . time coincident" would be variable. Birch I. Further, one of ordinary skill in the art would not be able to enable the delay in May (a variable delay) without undue experimentation. Birch I.

At best, therefore, May can only be used as a reference under Section 103 with respect to the "delay element," as recited in claims 2, 14 and 18. See M.P.E.P. § 2121.01; Elan Phan., Inc. v. Mayo Found. For Med. Educ. & Research, 346 F.3d 1051,1054,68 USPQ2d 1373, 1376 (Fed. Cir. 2003) ("A claimed invention cannot be anticipated by a prior art reference if the allegedly anticipatory disclosures cited as prior art are not enabled."); see also Symbol Techs. Inc. v. Opticon Inc., 935 F.2d 1569, 1578, 19 USPQ2d 1241, 1247 (Fed. Cir. 1991) (stating "a non-enabling reference may qualify as prior art for the purpose of determining obviousness under 35 U.S.C. 103."). The Examiner, however, has not alleged that the "delay element" recited in clam 2 is obvious in view of May. Further, enabling the variable delay in May is beyond the skill of one of ordinary skill in the art. Birch I.

The Birch II Declaration provides further evidence that even if May inherently disclosed "that the input signal is delayed by at least half of the pulse shape duration," which it does not, May would not enable one of ordinary skill in the art to carry out the

[2] The declarations by Dr. Birch not only show that Dr. Birch is a well-respected expert in the field, but that he has made these statements acknowledging that "willful false statements and the like so made [by Dr. Birch] are punishable by fine or imprisonment."

claimed invention. Birch II at ¶¶ 18-21.[3] The peaks in May's correcting signal are not offset in time from the modulated signal by a constant interval. Id. at ¶ 19. In addition, feeding May's modulated signal through a fixed delay element will not correctly align the amplitude peaks with the peaks in the correcting signal. Id. May provides no description of circuitry for correctly aligning the amplitude peaks with the peaks in the correcting signal. Id. In addition, a person of ordinary skill in the art could not implement such a system described in May without undue experimentation. Id. Therefore, these claims are not anticipated or obvious in view of May. Reversal of the rejection is respectfully requested.

As further support for its position, Appellant submitted additional evidence that questions the impartiality of the inventor, Mr. McCallister, in providing the submissions relied on by the Examiner. Namely, Appellant submitted a declaration from Paul Bernkopf, Chief Patent Counsel for the Appellant (hereinafter Bernkopf). Bernkopf provides evidence concerning an exchange between Mr. McCallister and Appellant concerning a possible license to the technology covered by the present application. In addressing this declaration, the Examiner stated that the Appellant has not demonstrated a "'nexus' between the merits of the claimed invention and the evidence of secondary considerations." Appellant respectfully traverses this assertion.

There is a nexus between the Bernkopf declaration and the merits of the claimed invention. Mr. McCallister's submissions attempt to provide evidence that the claims of the present application are not patentable. The Bernkopf declaration demonstrates that Mr. McCallister could benefit from the denial or narrowing of the claims of the present application. Thus, there is a nexus between the Bernkopf declaration and the merits of the claimed invention.

Mr. McCallister stated in his submissions in July and August 2005 that he has "no interest in the application." It appears that he made these statements to establish that he is unbiased and impartial in his opinion concerning the teachings of May and their

[3] In the response to arguments section of the final office action, the Examiner states that paragraph 21 of Mr. Birch's second declaration "suggests that a non-fixed delay is used in May." This is not correct. Mr. Birch did not suggest that May uses a non-fixed delay. Rather, Mr. Birch suggested that a fixed delay would not work in May.

relationship to the present claims. From the record, it also appears that Mr. McCallister has been successful in convincing the Examiner that he is an impartial witness as the Examiner accepted his submission over Appellant's expert stating that Mr. McCallister "is the better expert in the field of his own invention." In the Response to Arguments section of the Final Office Action, the Examiner went one step further and stated that "[i]t is the examiner [sic] position that the inventor's work related to the current invention is an ***irrefutable proof*** that he is the better expert in the subject matter related to the field of his invention." Final Office Action, p. 6, lines 16-19 (emphasis added). Appellant respectfully submits that Mr. McCallister is not the better expert.

In June 2007, the Appellant submitted evidence that calls into question the impartiality of Mr. McCallister as an expert. According to this evidence, Mr. McCallister attempted to obtain an exclusive license to the patent that is the basis for this reissue application for his employer. See Bernkopf, at ¶¶ 3-5. Mr. McCallister did not receive any license to the patent for his employer. Id. at ¶¶ 6-7. Because Mr. McCallister did not obtain any license to the patent for his employer, his employer may be required to pay royalties to the owner of the present application. This makes his interest adverse to the issuance of this reissue application as explained on p. 14 of the Response filed on June 11, 2007 in this application. Mr. McCallister's employer would benefit from the reissue application being denied or issuing with narrower claims.

Mr. McCallister's actions continue to demonstrate that he has an adverse interest in the current application. For example, this application is related to U.S. Application Serial No. 10/718,507. The Examiner indicated that some of the claims in that application were allowable. In response to this indication of allowability of some of the claims, Mr. McCallister generated further submissions in September and November 2007 arguing that most of these claims are not allowable. This clearly demonstrates that Mr. McCallister is attempting to protect the interests of his employer to avoid any liability for practicing the invention covered in these two reissue applications.

In addition to bias, Mr. McCallister cannot be considered a better expert with respect to his invention because of the likelihood that hindsight will taint his view of the prior art. Mr. McCallister is an inventor. He is not one of ordinary skill in the art nor has

he demonstrated that he is capable of opining on the knowledge of one of ordinary skill in the art. In addition, Mr. McCallister was able to solve the problems addressed by his invention and is thus intimately familiar with the need for delay from his own work *as an inventor*. Given that familiarity with the issues, it would not be unreasonable to expect that he would view the prior art, such as May, through the lens of his own invention. In this light, it is to be expected that he would draw the conclusion that May requires the delay issue to be addressed; not because one of ordinary skill in the art would understand the issue that way, but, because an inventor would. His intimacy with the issue should disqualify him as an expert concerning what would be known or obvious to one of ordinary skill in the art because his intimacy with the issue leads to hindsight reconstruction of his invention from the prior art.

b. May does not teach linear amplification

Each of claims 2, 14, and 18 include a limitation related to a "linear amplifier" or "linearly amplifying." Appellant respectfully submits that May does not teach or suggest the use of a linear amplifier or linearly amplifying as called for in the claims. As support for this position, Appellant relies on the Declaration of J. Neil Birch, dated June 5, 2007 at ¶¶ 9-12. The Examiner points only to the submissions of Mr. McCallister concerning this limitation. In light of the arguments presented above with respect to the credibility of Mr. McCallister's submissions, Appellant submits that May does not teach this limitation.

Based on the foregoing arguments, Appellant respectfully requests that the Board reverse the decision of the Examiner and allow claims 2-5, 8-11, 13-16, 18, and 20-23.

B. Rejection of claims under 35 U.S.C. § 103(a)

i. The Applicable Law

35 U.S.C. § 103 provides in relevant part:

Conditions for patentability, non-obvious subject matter.

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the

> differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

In its landmark decision interpreting this section of the Patent Act, the Supreme Court has said:

> Under 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.

Graham v. John Deere Co., 383 U.S. 1, 17-18 (1966).

The Supreme Court recently reaffirmed the approach to determining obviousness as set out in Graham. KSR Intern. Co. v. Teleflex Inc., 550 U.S. ___, slip op. at 14, 82 U.S.P.Q.2d 1385, 1391 (S.Ct. 2007) (citing Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966)). The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court in KSR, 550 U.S. ___, 82 USPQ2d at 1396 noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit.

Obviousness is not merely demonstrated by showing that each element was independently known in the prior art. KSR, 550 U.S. ___, 82 USPQ2d at 1396. The Supreme Court also noted in KSR that if the actual application of the technique would have been beyond the skill of one of ordinary skill in the art, then using the technique would not have been obvious. KSR, 550 U.S. ___, 82 USPQ2d at 1396.

When applying 35 U.S.C. §103(a), the claimed invention must be considered as a whole; the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; the references must be viewed without the benefit of impermissible hindsight afforded by the claimed invention and a

reasonable expectation of success is the standard with which obviousness is determined. *Hodosh v. Block Drug Co., Inc.,* 786 F.2d 1136, 1143 n.5 (Fed. Cir. 1986).

Combining references under 35 U.S.C. §103(a) has been held improper when such combinations are counter-intuitive. For example, references cannot be combined where the reference teaches away from their combination. It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983) (The claimed catalyst which contained both iron and an alkali metal was not suggested by the combination of a reference which taught the interchangeability of antimony and alkali metal with the same beneficial result, combined with a reference expressly excluding antimony from, and adding iron to, a catalyst.). It had also been held that proceeding contrary to accepted wisdom is evidence of nonobviousness. The totality of the prior art must be considered, and proceeding contrary to accepted wisdom in the art is evidence of nonobviousness. *In re Hedges,* 783 F.2d 1038, 228 USPQ 685 (Fed. Cir. 1986).

Federal Circuit precedent describes the relative burden of the applicant and the Patent Office on the issue of Obviousness. The Federal Circuit has held that

> During patent examination the PTO bears the initial burden of presenting a prima facie case of unpatentability . . . If the PTO fails to meet this burden, then the applicant is entitled to the patent. However, when a *prima facie* case is made, the burden shifts to the applicant to come forward with evidence and/or argument supporting patentability.

In re Glaug, 283 F.3d 1335, 1338 (Fed.Cir. 2002).

Rebuttal evidence is "merely a showing of facts supporting the opposite conclusion ... and may relate to any of the Graham factors including the so-called secondary considerations." *In re Piasecki,* 745 F.2d 1468, 1472 (Fed.Cir. 1984)(citation omitted). When a patent applicant puts forth rebuttal evidence, the patent office must consider that evidence. See *In re Soni*, 54 F.3d 746, 750 (Fed.Cir. 1995) (stating that "all evidence of nonobviousness must be considered when assessing patentability").

ii. Rejection of claims 6, 7, 17, and 19

Claims 6, 7, 17, and 19 were rejected under 35 USC § 103(a) as being unpatentable over May in view of U.S. Patent No. 6,266,320 (Hedberg). Appellant respectfully traverses this rejection.

Claims 6, 7, and 17 each include a limitation related to a "linear amplifier" or "linearly amplifying." Appellant respectfully submits that May does not teach or suggest the use of a linear amplifier or linearly amplifying as called for in the claims. As support for this position, Appellant relies on the Declaration of J. Neil Birch, dated June 5, 2007 at ¶¶ 9-12. In light of the arguments presented above with respect to the credibility of Mr. McCallister's submissions, Appellant requests the Examiner to reconsider the testimony of Dr. Birch with respect to these limitations. Based on this testimony, Appellant asserts that claims 6, 7, and 17 are also allowable. Reversal of the rejection is respectfully requested.

Further, claims 6 and 17 each include a limitation to CDMA modulation. For example, claim 6 specifies that the "modulated-signal generator is a code division multiple access (CDMA) modulator." Similarly, claim 17 specifies that the "first modulated-signal generating activity configures said first modulated signal as a code division multiple access (CDMA) signal."

The Examiner acknowledged that May does not teach use of a CDMA modulator. Final Office Action, p. 5, lines 1-2. The Examiner concludes, however, that "it would have been obvious to one skill [sic] in the art to implement the generator as a CDMA modulator as taught by Hedberg et al so as to be compatible with system(s) that uses CDMA technology. Applicant respectfully asserts that this rationale does not pass muster under the standard set by the Supreme Court in KSR.

The Examiner did not provide any technical analysis as to the compatibility of the peak to average ratio reduction circuit of May with the system of Hedberg. There was no clear articulation of what one of ordinary skill in the art would see in these two references or the general knowledge that would lead him, using only ordinary creativity, to combine these teachings. Further, unlike KSR, the Examiner failed to walk through a logical

progression of concepts that would lead one of ordinary skill in the art to the inexorable conclusion that the references should be combined. Rather, the Examiner attempts to support this combination with a conclusory statement about that one of skill in the art would combine the references to use May in a CDMA system. Appellant respectfully asserts that this is not proper. Reversal of the rejection is respectfully requested.

Claim 19 depends from claim 18 and is allowable at least for the reasons identified above with respect to claim 18. Further, claim 19 also calls for a CDMA modulator. As discussed above, the combination of May and Hedberg is not proper. Reversal of the rejection of claim 19 is respectfully requested.

Respectfully submitted,

Date: September 25, 2008

/David N. Fogg/
David N. Fogg
Reg. No. 35138

Attorneys for Appellant
Fogg & Powers LLC
P.O. Box 581339
Minneapolis, MN 55458-1339
T – (612) 332-4720
F – (612) 332-4731

CLAIMS APPENDIX

2. A constrained-envelope digital communications transmitter circuit comprising:

a modulated-signal generator for generating a first modulated signal conveying to-be-communicated data, having a first bandwidth and having a first peak-to-average amplitude ratio;

a constrained-envelope generator for generating a constrained bandwidth error signal in response to said first modulated signal;

a combining circuit for combining said constrained bandwidth error signal with said first modulated signal to produce a second modulated signal conveying said to-be-communicated data, said second modulated signal having substantially said first bandwidth and a second peak-to-average amplitude ratio, said second peak-to-average amplitude ratio being less than said first peak-to average amplitude ratio;

a substantially linear amplifier configured to amplify said second modulated signal; and

a delay element coupled between said modulated-signal generator and said combining circuit to delay said first modulated signal into synchronism with said constrained bandwidth error signal.

3. A constrained-envelope digital communications transmitter circuit as claimed in claim 2, wherein said constrained-envelop& generator is configured so that said constrained bandwidth error signal exhibits a bandwidth substantially equal to or less than said first bandwidth.

4. A constrained-envelope digital communications transmitter circuit as claimed in claim 2 wherein: peaking unit intervals occur when said first modulated signal exhibits magnitudes greater than a threshold;

said constrained bandwidth error signal includes error bursts for said peaking unit intervals, wherein each error burst spreads energy over a plurality of unit intervals and exhibits a peak in one unit interval; and

said delay element delays said first modulated signal so that error burst peaks substantially temporally coincide with said peaking unit intervals.

5. A constrained-envelope digital communications transmitter circuit as claimed in claim 4 wherein said error burst peaks exhibit amplitudes which are responsive to amounts by which magnitudes of said first modulated signal exceed said threshold.

6. A constrained-envelope digital communications transmitter circuit comprising:

a modulated-signal generator for generating a first modulated signal conveying to-be-communicated data, having a first bandwidth and having a first peak-to-average amplitude ratio;

a constrained-envelope generator for generating a constrained bandwidth error signal in response to said first modulated signal;

a combining circuit for combining said constrained bandwidth error signal with said first modulated signal to produce a second modulated signal conveying said to-be-communicated data, said second modulated signal having substantially said first bandwidth and a second peak-to-average amplitude ratio, said second peak-to-average amplitude ratio being less than said first peak-to-average amplitude ratio; and

a substantially linear amplifier configured to amplify said second modulated signal;

wherein said modulated-signal generator is a code division multiple access (CDMA) modulator and said first modulated signal conveys a plurality of code-channels of said to-be-communicated data.

7. A constrained-envelope digital communications transmitter circuit as claimed in claim 6 wherein said CDMA modular includes a Nyquist-type pulse spreading filter which provides said first modulated signal.

8. A constrained-envelope digital communications transmitter circuit as claimed in claim 2 wherein said constrained-envelope generator comprises:

a pulse generator responsive to said first modulated signal; and

a filter having an input coupled to said pulse generator and being configured to generate said constrained bandwidth error signal.

9. A constrained-envelope digital communications transmitter circuit as claimed in claim 8 wherein said pulse generator is configured to generate a pulse when said first modulated signal exhibits a magnitude greater than a threshold.

10. A constrained-envelope digital communications transmitter circuit as claimed in claim 9 wherein said pulse generator is further configured so that said pulse exhibits an amplitude which is responsive to a value by which said first modulated signal exhibits said magnitude greater than said threshold.

11. A constrained-envelope digital communications transmitter circuit as claimed in claim 2 wherein said substantially linear amplifier comprises:

a linearizer configured to pre-distort said second modulated signal into a pre-distorted signal; and a radio-frequency amplifying circuit configured to generate a radio-frequency broadcast signal from said pre-distorted signal.

13. A method as claimed in claim 14 wherein said constrained bandwidth error signal exhibits a bandwidth substantially equal to or less than said first bandwidth.

14. In a digital communications system, a method for transmitting a constrained-envelope communications signal comprising:

generating a first modulated signal conveying to-be-communicated data and having a first bandwidth and a first peak-to-average amplitude ratio; generating a constrained bandwidth error signal in response to said first modulated signal;

combining said constrained bandwidth error signal with said first modulated signal to produce a second modulated signal conveying said to-be-communicated data, said second modulated signal having substantially said first bandwidth and a second

peak-to-average amplitude ratio, said second peak-to-average amplitude ratio being less than said first peak-to-average amplitude ratio;

linearly amplifying said second modulated signal; and

delaying said first modulated signal into synchronism with said constrained bandwidth error signal.

15. A method as claimed in claim 14 wherein:

peaking unit intervals occur when said first modulated signal exhibits magnitudes greater than a threshold;

said constrained bandwidth error signal includes error bursts for said peaking unit intervals, wherein each error burst spreads energy over a plurality of unit intervals and exhibits a peak in one unit interval; and

said first modulated signal is delayed so that error burst peaks substantially temporally coincide with said peaking unit intervals.

16. A method as claimed in claim 15 additionally comprising forming said constrained bandwidth error signal so that said error burst peaks exhibit amplitudes which are responsive to amounts by which magnitudes of said first modulated signal exceed said threshold.

17. In a digital communications system, a method for transmitting a constrained-envelope communications signal comprising:

generating a first modulated signal conveying to-be-communicated data and having a first bandwidth and a first peak-to-average amplitude ratio; generating a constrained bandwidth error signal in response to said first modulated signal;

combing said constrained bandwidth error signal with said first modulated signal to produce a second modulated signal conveying said to-be-communicated data, said second modulated signal having substantially said first bandwidth and a second peak-to-average amplitude ratio, said second peak-to-average amplitude ratio being less than said first peak-to-average amplitude ratio; and

linearly amplifying said second modulated signal;

wherein said first-modulated-signal-generating activity configures said first modulated signal as a code division multiple access (CDMA) signal conveying a plurality of code-channels of said to-be-communicated data.

18. A constrained-envelope digital communications transmitter circuit comprising:

a modulated-signal generator for generating a first modulated signal conveying to-be-communicated data, having a first bandwidth and having a first peak-to-average amplitude ratio;

a constrained-envelope generator for generating a constrained bandwidth error signal in response to said first modulated signal, said constrained bandwidth error signal exhibiting a bandwidth substantially equal to or less than said first bandwidth, and said constrained bandwidth error signal exhibiting peak amplitudes which are responsive to amounts by which magnitudes of said first modulated signal exceed a threshold;

a delay element for delaying said first modulated signal into synchronism with said constrained bandwidth error signal;

a combing circuit for combining said constrained bandwidth error signal with said first modulated signal to produce a second modulated signal conveying said to-be-communicated data, said second modulated signal having substantially said first bandwidth and a second peak-to-average amplitude ratio, said second peak-to-average amplitude ratio being less than said first peak-to average amplitude ratio; and

a substantially linear amplifier configured to amplify said second modulated signal.

19. A constrained-envelope digital communications transmitter circuit as claimed in claim 18 wherein said modulated-signal generator is a code division multiple access (CDMA) modulator and said first modulated signal conveys a plurality of code-channels of said to-be-communicated data.

20. A constrained-envelope digital communications transmitter circuit as claimed in claim 18 wherein:

peaking unit intervals occur when said first modulated signal exhibits magnitudes greater than said threshold;

said constrained bandwidth error signal includes error bursts for said peaking unit intervals, wherein each error burst spreads energy over a plurality of unit intervals and exhibits a peak in one unit interval; and

said delay element delays said first modulated signal so that error burst peaks substantially temporally coincide with said peaking unit intervals.

21. The constrained-envelope digital communications transmitter circuit of claim 2, wherein the delay element is a fixed delay element.

22. The method of claim 14, wherein delaying said first modulated signal includes delaying said first modulated signal by a fixed delay.

23. The constrained-envelope digital communications transmitter circuit of claim 18, wherein the delay element is a fixed delay element.

EVIDENCE APPENDIX

The Evidence Appendix includes the following documents:

1. Declaration under 37 C.F.R. §1.132 from Neil Birch dated May 17, 2006 (Referred to as Birch I).
2. Declaration under 37 C.F.R. §1.132 from Neil Birch dated June 5, 2007 (Referred to as Birch II).
3. Inventor's Submission Under 37 C.F.R. 1.56 dated July 5, 2005 (Referred to as McCallister I).
4. Inventor's Submission Under 37 C.F.R. 1.56 dated August 16, 2006 (Referred to as McCallister II).
5. Declaration of Paul Bernkopf under 37 C.F.R. §1.132 (Referred to as Bernkopf)

PATENT
Attorney Docket No. 08343.0020-01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	
Ronald D. McCallister et al.	Group Art Unit: 2637
Application No.: 10/718,505	Examiner: Jean B. Corrielus
Filed: November 19, 2003	Confirmation No.: 1245
For: Constrained-Envelope Transmitter and Method Therefor	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

DECLARATION UNDER 37 C.F.R. § 1.132

I, Neil Birch, do hereby make the following declaration:

1. I have been retained by the Intersil Corporation, assignee of the above-captioned reissue patent application.

2. I am an expert in communication systems, including OFDM radio transmission systems. My qualifications are listed below starting at paragraph 15.

3. This declaration contains my opinions with respect to the article entitled "Reducing the Peak-to-Average Power Ratio in OFDM Radio Transmission Systems," by Thomas May and Herman Rohling, published by the IEEE in 1998 ("*May*").

4. I have read and understand the *May* article.

5. I have also read the Inventor's Submission under 37 C.F.R. § 1.56, signed July 5, 2005, by Ronald D. McCallister ("Inventor's Submission").

6. The Inventor's Submission states the following on page 1 (underlining removed):

> Since the pulse-shape extends in both directions in time from the point at which its peak occurs, the teaching clearly requires that the input signal is delayed by at least half of the pulse-shape duration. In view of the foregoing, it is clear that May's approach inherently uses a delay; in my opinion it cannot be done any other way.

7. *May* does not disclose how to delay "the input signal," as described in the Inventor's Submission.

8. *May* also does not disclose how to delay "the input signal . . . by at least half of the pulse-shape duration," as described in the Inventor's Submission.

9. The Inventor's Submission states the following on page 2: "May clearly teaches that the scaled bandlimited pulse-shape must be time aligned so that the pulse peak and the signal peak are time-coincident . . . ."

10. *May* does not disclose how to time-align the scaled bandlimited pulse-shape "so that the pulse peak and the signal peak are time-coincident," as described in the Inventor's Submission.

11. The delay in *May* to make "the pulse peak and the signal peak . . . time-coincident" would be a variable delay.

12. The delay in *May* to delay "the input signal . . . by at least half of the pulse-shape duration" would be a variable delay.

13. It is my opinion that one of ordinary skill in the art would not be able to devise a variable delay circuit to make "the pulse peak and the signal peak . . . time-coincident" in *May* without undue experimentation.

14. It is my opinion that one of ordinary skill in the art would not be able to delay "the input signal . . . by at least half of the pulse-shape duration" under the variable signal conditions of *May* without undue experimentation.

QUALIFICATIONS

15. I currently serve as an advisor to the Intelligence Community on matters of communications security and exploitation.

16. I am the Chief Technical Officer and for Earth Communications Ltd.

17. I was formerly the president of Birch Associates Inc., a Washington based consulting firm that dealt in Command Control, Communications, and Intelligence matters.

18. I graduated with a Bachelor of Science degree in Electrical Engineering from North Carolina State University in 1958. After working for Western Electric for a short period of time, I was assigned to the National Security Agency as an engineering officer in the U.S. Air Force. During this period of time, I worked on advanced High Frequency (HF) intercept equipment, microwave amplifiers, and receivers, and interpretation of new and unusual signals. Also, during this period of time, I obtained a Master of Science degree in Electrical Engineering from Catholic University and began work on my doctoral degree. I taught a microwave measurements laboratory and a course in electromagnetism to undergraduate students at Catholic University. I also continued research in voice processing and in the effects of time perturbations on voice quality and intelligibility.

19. I received my Doctorate in Electrical Engineering from Catholic University during the fall of 1965 with formal graduation in the spring of 1966. Meanwhile, I

continued teaching at Catholic University, developing a course in analog and digital communications, which I taught at the graduate level.

20. While at the National Security Agency, I was promoted to branch chief responsible for spread spectrum communications and conventional military tactical communications, where I helped develop and tested the first transmitted reference spread spectrum communication system over satellite. I was also responsible for commissioning and overseeing the first definitive widely distributed document on spread spectrum communications entitled “Spread Spectrum Communications.”. I was also in charge of the National Security Agency branch that developed the first digital spread spectrum "rake" receiver for a "tropo-scatter channels."

21. I was also responsible for the establishment of certain U.S. and Allied communications standards which ensure radio interoperability among military allies with near optimum radio performance. I also performed fundamental research into the performance of electronic timing circuits in digital, secure radio equipment.

22. After my promotion to division chief at the National Security Agency, I left government service in 1967 to join Magnavox Co. While at Magnavox, I created and managed Magnavox Advanced Systems Analysis Office, a Washington-based research facility that worked for National Aeronautics and Space Administration ("NASA"), the Department of Defense, and the Advanced Research Project Agency.

23. I designed the first NASA tracking and data relay satellite transponder (TDRS), which was a spread spectrum modem. I also evaluated the space-earth-space multipath channel for tracking and data relay satellite and the effects on spread spectrum signals.

24. I also led new business activities in the areas of spread spectrum communications, satellite transponder designs, voice coding and intelligibility testing, time varying multi-path communications channel modeling, and communications packages for environmental sensor systems. Based on the design work I led in these areas, NASA later developed transponders for operational NASA satellites. In addition to these activities, I continued to teach a communications course at Catholic University and developed a course in space communications, which I taught internationally.

25. In 1973, I returned to government service as Chief Scientist for the U.S. Navy for Telecommunications Command and Control Systems. My duties within the U.S. Navy included advising the Chief of Naval Operations on all U.S. Navy related spread spectrum developments and coordinating research and development programs on telecommunications within the U.S. Navy and with other military services. These programs involved U.S. Navy and joint satellite programs, submarine communications, and task force communications.

26. In 1975, I accepted the position of Chief Scientist with the Office of the Secretary of Defense for Telecommunications, Command and Control Systems, and subsequently became the Deputy Assistant Secretary of Defense for Communications, Command and Control of Intelligence programs for the U.S. Military Services. I was responsible for all U.S. Department of Defense spread spectrum and conventional communication developments for the U.S. Military Services and provided technical guidance on all electronic U.S. Department of Defense activities that supported strategic, theater, and tactical forces. I was instrumental in bringing to fruition a number of electronic systems that were subsequently used by U.S. forces in "Desert Storm."

27. In 1975, I helped establish the Joint Tactical Information Distribution System (JTIDS) program between the U.S. Air Force and U.S. Navy, a major wireless joint service communications system.

28. In 1979, I left the Pentagon to form Birch Associates Inc., a Washington based consulting firm dealing in Command Control, Communications, and Intelligence matters. The company assisted U.S. and foreign corporations and governmental operations in activities relating to electronic communications, security, and surveillance. I served on a number of U.S. Government defense oriented committees and participated as a member of the board of directors for three high technology firms.

29. I was an active member of the Armed Forces Communication Electronic Association for which I have developed a number of continuing engineering education courses. I have assisted the Catholic University of America over the past several years by conducting seminars, consulting on its electrical engineering curriculum, obtaining summer jobs for engineering students, and by recommending ways to equalize enrollment in engineering in Catholic University.

30. In addition to receiving two distinguished civilian service awards while in the U.S. Government, I was elected Fellow of the Institute of Electronic and Electrical Engineers in 1986 for my contributions to U.S. military communications and Life Fellow in 2002.

31. I have served on Department of Defense panels dealing with the MILSTAR satellite spread spectrum waveforms and the spread spectrum waveforms associated with Ballistic Missile Defense (BMD) communications. I have also

participated in the evolution of the U.S. Navy's Data Distribution System, which is a spread spectrum communication system for missile defense.

32. I have been an expert witness in several patent infringement cases involving communications technologies, some of which involved advanced digital wireless technologies. I am a co-inventor and patent holder for a technique to counter cellular telephone fraud.

33. I developed and taught a number of courses in communications and telecommunications, which I have presented in the U.S. and abroad over the past twenty-five years. These include, "Advanced Communications," "High Frequency Radio," "Spread Spectrum Communications," "Military Command, Control, Communications and Intelligence," "Space Communications," "Integrated Services Digital Networks," "Data Links," and "Voice Coding."

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: 5/17/06

By: Neil Birch

Neil Birch

8831 Mustang Island Circle
Naples, FL 34113

PATENT
Attorney Docket No. 0064-0002RIS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
Ronald D. McCallister et al.	)	Group Art Unit: 2611
Application No.: 10/718,505	)	Examiner: Jean B. Corrielus
Filed: November 19, 2003	)	Confirmation No.: 1245
For: Constrained-Envelope Transmitter and Method Therefor	)	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

DECLARATION UNDER 37 C.F.R. § 1.132

I, J. Neil Birch, hereby make the following declaration:

1. I have been retained by Intersil Americas, Inc., assignee of the above-captioned reissue patent application.

2. I am an expert in communications systems, including OFDM radio systems.

3. This declaration supplements the declaration filed in the U.S. Patent and Trademark Office in the above-captioned patent application on May 18, 2006. My qualifications are set forth in that previous declaration and are not repeated herein.

4. I have read the "Inventor's Submission Under 37 C.F.R. 1.56" filed by Ronald D. McCallister (a named inventor of the above-captioned patent application) dated August 16, 2006 (the "August 16 Submission").

5. In the August 16 Submission, Mr. McCallister quotes on page 2 several sentences from the beginning of section II of the May et al. reference ("Reducing the Peak-to-Average Power Ratio in OFDM Radio Transmission Systems, "*Proceedings of the 1998 Vehicular Technology Conference*, May 18, 1998).

6. The portion quoted from May by Mr. McCallister includes the following:

> "This means that the signal is amplified linearly up to a maximal input amplitude A_o and larger amplitudes are limited to A_o, see Fig. [1]. Based on this assumption, we also model the amplifier as an ideal limiter with amplitude threshold A_o in this paper."

7. Mr. McCallister then states that it is his belief that the statement "the signal is amplified linearly" in the quoted passage "would be appreciated by a person of ordinary skill in the art as describing the claimed linearizer or linearizing limitations [of the claims of the above-captioned application]. In addition, Figure 1 of May, duplicated below, shows linearization up to a maximal input amplitude."

8. Mr. McCallister's representation of the teaching of May regarding use of a linear amplifier as set forth in the claims of the above-captioned application totally mischaracterizes the content of the May reference.

9. The amplifier described in May is modeled as an "ideal limiter" with normalized input and output amplitudes as shown in Fig. 1.

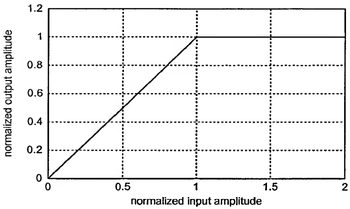

Fig. 1. Ideal limiter with normalized input and output amplitude, maximal input amplitude $A_0 = 1$

10. The amplifier described in May is a classic form of <u>non-linear</u> amplifier. Such amplifiers are also referred to as "clipping amplifiers" or "saturating amplifiers." See Spilker, *Digital Communications by Satellite*, 1977 (Exhibit A). Persons skilled in the art would understand that the amplifier modeled in May is a <u>non-linear</u> amplifier, contrary to Mr. McCallister's conclusion.

11. The May reference describes a theoretical system that manipulates an OFDM (Orthogonal Frequency Division Multiplexed) signal by introducing an additive correcting function that reduces amplitude peaks exceeding the clipping threshold A_0 of the non-linear clipping amplifier. May at 2474, col. 2, lines 9-14.

12. May's additive correcting function k(t) is composed with the auxiliary function g(t) as set forth in the three equations at the bottom of page 2475, second column.

$$c(t) = s(t) + k(t) \quad where$$

$$k(t) = \sum_{n} A_n g(t - t_n)$$

$$A_n = -(|s(t_n)| - A_0)\frac{s(t_n)}{|s(t_n)|}$$

As noted (equation 3), A_n is expressed in terms of the clipping threshold A_o of the non-linear amplifier. Accordingly, May's correcting function is based on the characteristics, i.e., the clipping threshold, of the non-linear amplifier used in his system.

13. The constrained-envelope digital communications transmitter claimed in the above-captioned patent application is used with systems that receive quadrature phase-point signal streams and that operate with a substantially linear amplifier.

14. Persons skilled in the art would not find the subject matter of the claims of the above-captioned application requiring quadrature phase-point signal streams and a linear amplifier disclosed in, or obvious from, the teaching of May because the core teaching of May is to generate and apply a correcting signal that is tailored to the non-linearity of the amplifier used in the system.

15. I've reviewed the teaching of Dent patent 5,262,734. Dent describes a linear RF power amplifier 10 that produces intermodulation products at frequencies not present at the amplifier input. Dent uses a pre-distortion circuit and a distortion analyzer to introduce pre-distortions into the amplifier input to compensate for the intermodulation products. Dent col. 2, lines 7-15.

16. Dent's amplifier is not the "ideal limiter" required by the system modeled in May. Dent's amplifier is a linear amplifier. Dent col. 3, line 10. May's system would not

function as disclosed if the linear amplifier of Dent were substituted for May's non-linear amplifier.

17. May's correcting signal k(t) is generated only when the amplifier input exceeds the clipping threshold A_o. Dent's linear amplifier has no disclosed clipping threshold and receives only inputs which have been modified by the predistoring circuit so they are amplified in a linear manner. Dent col. 5, lines 36-48. Use of Dent's amplifier would thus render May's correcting signal generator non-operable, i.e., amplifier inputs would not exceed A_o.

18. The following supplements my declaration dated May 17, 2006, which was filed in the above-captioned application with the Amendment of May 30, 2006, on the matter of delaying the correcting signal k(t) in May.

19. May employs OFDM modulation. OFDM signals contain multiple subcarriers of different frequencies. For example, May's Fig. 3 shows a correcting function k(t) for an OFDM signal with 128 subcarriers. PSK or QAM modulation of the subcarriers is based on random distribution of data. The subcarriers are combined using inverse Fourier transformation. VanNee, *OFDM For Wireless Multimedia Communications*, 33-36 (Exhibit B).

20. May's continuous-time OFDM signal contains randomly occurring amplitude peaks attributable to the random data modulation patterns. See May Fig. 2. May's correcting signal k(t) is based on the Gaussian function g(t) of variance $\sigma_f^2 = 1/2\pi\sigma^2$. May at 2475, col. 2, lines 12-15. Hence, the peaks in May's correcting signal k(t) are not offset in time from the modulated signal s(t) by a constant interval.

21. Feeding May's modulated signal s(t) through a fixed delay element will not correctly align the amplitude peaks with the peaks in the correcting signal k(t). May provides no description of circuitry for correctly aligning the amplitude peaks of the modulated signal s(t) with the peaks in the correcting signal k(t). In my opinion a person of ordinary skill in the art could not implement May's system without undue experimentation.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: June 5, 2007

By: J. Neil Birch
J. Neil Birch

EXHIBIT A

Digital Communications by Satellite

J. J. SPILKER, JR. Ph.D.
Chairman, Stanford Telecommunications, Inc.

PRENTICE-HALL, INC., *Englewood Cliffs, New Jersey*

Library of Congress Cataloging in Publication Data

Spilker, J J

Digital communications by satellite.

(Prentice-Hall information and system sciences series)

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2. Data transmission systems. I. Title.

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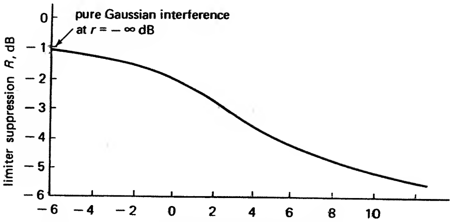

Fig. 9-13 Limiter suppression versus power ratio for a mixture of Gaussian and sinusoidal interference. The suppression approaches 6 dB as the interference becomes a pure sinusoid, $r = \infty$ dB.

9-6 DISTORTION CAUSED BY AMPLITUDE NONLINEARITIES

Signal suppression is only one of the effects caused by amplifier nonlinearities. One of the most important performance measures is the signal-to-distortion ratio—the ratio of individual signal power to the distortion power in the signal passband. We first determine the output signal-to-distortion spectral-density ratio versus the drive level. These results determine how much the transponder output power—power backoff—must be reduced to achieve a desired signal-to-distortion ratio for both sinusoidal and Gaussian inputs. As an intermediate step toward this calculation, the total signal power and total distortion power are calculated.

Piecewise Linear Bandpass Limiter

The transponder nonlinearity to be used here is the piecewise linear limiter, or clipping amplifier, shown in Fig. 9-14. The zonal filter passes only those frequency components in the fundamental frequency zone corresponding to the bandpass input. This model of a saturating amplifier is used in place of a hard limiter because it allows us to calculate the improvement resulting from power backoff. It is the simplest model of a saturating amplifier. Results for a hard limiter are obtained by letting the output be $y(t)/c$ and $c \rightarrow 0$.

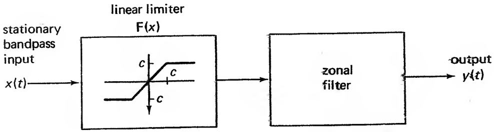

Fig. 9-14 Bandpass piecewise linear limiter model

Sinusoidal Input

As a first step, compute the variation in output power versus input power for the piecewise linear limiter. Let the input be a single sinusoid

$$x(t) = A\cos(\omega_0 t + \theta) = A\cos\phi \tag{9-29}$$

where $p(\phi) = \dfrac{1}{2\pi} \qquad |\phi| \leq \pi$

The output sinusoid amplitude in the fundamental zone is then

$$\begin{aligned} g(A) \triangleq B_1 &= \frac{1}{\pi}\int_0^{2\pi} f(A\cos\phi)\cos\phi\, d\phi \\ &= \frac{4}{\pi}\int_0^{\pi/2} f(A\cos\phi)\cos\phi\, d\phi \end{aligned} \tag{9-30}$$

For a linear limiter and a small amplitude input which produces no clipping, $A \leq c$, the system is linear and $B_1 = A$. For larger inputs $A \geq c$, where saturation occurs at least on the peaks of the sinusoid. The output is the sum of contributions from the limiting and linear regions:

$$\begin{aligned} B_1 &= \frac{4}{\pi}\Bigg[\underbrace{c\int_0^{\cos^{-1} c/A} \cos\phi\, d\phi}_{\text{limiting region}} + \underbrace{\int_{\cos^{-1} c/A}^{\pi/2} A\cos^2\phi\, d\phi}_{\text{linear region}}\Bigg] \\ &= \frac{4c}{\pi}\left\{\sin\phi\Big|_0^{\cos^{-1} c/A} + \frac{A}{2c}\left[\phi + \frac{\sin 2\phi}{2}\right]_{\cos^{-1} c/A}^{\pi/2}\right\} \\ &= \frac{4c}{\pi}\left[\sqrt{1-\left(\frac{c}{A}\right)^2} + \frac{A}{2c}\sin^{-1}\frac{c}{A} + \underbrace{\frac{A}{2c}\sin\phi\cos\phi\Big|_{\cos^{-1} c/A}^{\pi/2}}_{\frac{-A}{2c}\sqrt{1-\left(\frac{c}{A}\right)^2}\,\frac{c}{A}}\right\} \end{aligned} \tag{9-31}$$

Thus, the output signal amplitude for this more general range of inputs is

$$B_1 = \frac{2c}{\pi}\left[\sqrt{1-\left(\frac{c}{A}\right)^2} + \frac{A}{c}\sin^{-1}\frac{c}{A}\right] \triangleq \gamma A \tag{9-32}$$

where γ is the equivalent gain. The power output at the fundamental frequency is $P_1 = B_1^2/2 \leq 8c^2/\pi^2$. The output power is plotted in Fig. 9-15 as a function of drive level $(A/c)^2$.

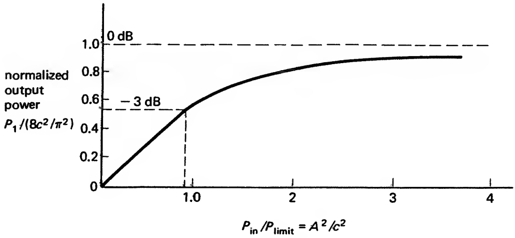

Fig. 9-15 Output versus input power for a piecewise linear limiter with a single sinusoidal input. The output power is normalized with respect to the maximum output power of the piecewise linear limiter.

An example of TWT transfer function (a "soft" limiter) is shown in Fig. 9-16. Both the output power and the intermodulation products are shown for two equal amplitude sine wave inputs.

Narrow-Band Gaussian Inputs

Consider a Gaussian input and compute the linear signal term and the intermodulation distortion components. Assume a bandpass input spectrum for the Gaussian input, as shown in Fig. 9-17. This spectrum can represent the sum of many frequency-multiplexed channels. If one channel is deleted, a notch would result in the input spectrum as shown. Intermodulation effects, caused by a nonlinear transponder amplifier or limiter, however, would partially fill in the notch in the amplifier output spectrum. The ratio of the intermodulation power in the notch to the signal power ordinarily in the notch gives the noise-power-ratio (NPR) or inverse SNR of that channel [Cahn, 1960, 53–59; Sunde, 1970, Chap. 8].

EXHIBIT B

OFDM for Wireless Multimedia Communications

Richard van Nee
Ramjee Prasad

Artech House
Boston • London

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Chapter 2

OFDM Basics

2.1 INTRODUCTION

The basic principle of OFDM is to split a high-rate datastream into a number of lower rate streams that are transmitted simultaneously over a number of subcarriers. Because the symbol duration increases for the lower rate parallel subcarriers, the relative amount of dispersion in time caused by multipath delay spread is decreased. Intersymbol interference is eliminated almost completely by introducing a guard time in every OFDM symbol. In the guard time, the OFDM symbol is cyclically extended to avoid intercarrier interference. This whole process of generating an OFDM signal and the reasoning behind it are described in detail in sections 2.2 to 2.4.

In OFDM system design, a number of parameters are up for consideration, such as the number of subcarriers, guard time, symbol duration, subcarrier spacing, modulation type per subcarrier, and the type of forward error correction coding. The choice of parameters is influenced by system requirements such as available bandwidth, required bit rate, tolerable delay spread, and Doppler values. Some requirements are conflicting. For instance, to get a good delay spread tolerance, a large number of subcarriers with a small subcarrier spacing is desirable, but the opposite is true for a good tolerance against Doppler spread and phase noise. These design issues are discussed in Section 2.5. Section 2.6 gives an overview of OFDM signal processing functions, while Section 2. ends this chapter with a complexity comparison of OFDM versus single-carrier systems.

2.2 GENERATION OF SUBCARRIERS USING THE IFFT

An OFDM signal consists of a sum of subcarriers that are modulated by using *phase shift keying (PSK)* or *quadrature amplitude modulation (QAM)*. If d_i are the complex

QAM symbols, N_s is the number of subcarriers, T the symbol duration, and f_c the carrier frequency, then one OFDM symbol starting at $t = t_s$ can be written as

$$s(t) = \operatorname{Re}\left\{ \sum_{i=-\frac{N_s}{2}}^{\frac{N_s}{2}-1} d_{i+N_s/2} \exp\left(j2\pi\left(f_c - \frac{i+0.5}{T}\right)(t-t_s)\right) \right\} \ , \ t_s \le t \le t_s + T$$
$$s(t) = 0 \ , \ t < t_s \ \wedge \ t > t_s + T \tag{2.1}$$

In the literature, often the equivalent complex baseband notation is used, which is given by (2.2). In this representation, the real and imaginary parts correspond to the in-phase and quadrature parts of the OFDM signal, which have to be multiplied by a cosine and sine of the desired carrier frequency to produce the final OFDM signal. Figure 2.1 shows the operation of the OFDM modulator in a block diagram.

$$s(t) = \sum_{i=-\frac{N_s}{2}}^{\frac{N_s}{2}-1} d_{i+N_s/2} \exp\left(j2\pi \frac{i}{T}(t-t_s)\right) \ , \ t_s \le t \le t_s + T$$
$$s(t) = 0 \ , \ t < t_s \ \wedge \ t > t_s + T \tag{2.2}$$

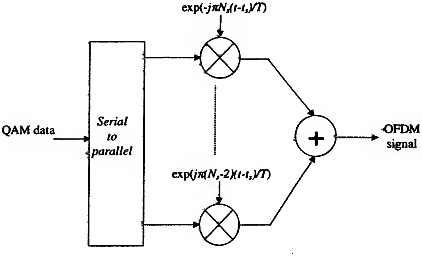

Figure 2.1 OFDM modulator.

As an example, Figure 2.2 shows four subcarriers from one OFDM signal. In this example, all subcarriers have the same phase and amplitude, but in practice the amplitudes and phases may be modulated differently for each subcarrier. Note that each subcarrier has exactly an integer number of cycles in the interval T, and the number of cycles between adjacent subcarriers differs by exactly one. This property accounts for

the orthogonality between the subcarriers. For instance, if the jth subcarrier from (2.2) is demodulated by downconverting the signal with a frequency of j/T and then integrating the signal over T seconds, the result is as written in (2.3). By looking at the intermediate result, it can be seen that a complex carrier is integrated over T seconds. For the demodulated subcarrier j, this integration gives the desired output $d_{j+N/2}$ (multiplied by a constant factor T), which is the QAM value for that particular subcarrier. For all other subcarriers, the integration is zero, because the frequency difference $(i-j)/T$ produces an integer number of cycles within the integration interval T, such that the integration result is always zero.

$$\begin{aligned}&\int_{t_s}^{t_s+T} \exp\left(-j2\pi \frac{j}{T}(t-t_s)\right) \sum_{i=-\frac{N_s}{2}}^{\frac{N_s}{2}-1} d_{i+N_s/2} \exp\left(j2\pi \frac{i}{T}(t-t_s)\right) \mathrm{dt} \\ &= \sum_{i=-\frac{N_s}{2}}^{\frac{N_s}{2}-1} d_{i+N_s/2} \int_{t_s}^{t_s+T} \exp\left(j2\pi \frac{i-j}{T}(t-t_s)\right) dt = d_{j+N_s/2} T\end{aligned} \tag{2.3}$$

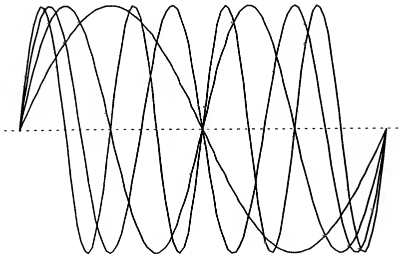

Figure 2.2 Example of four subcarriers within one OFDM symbol.

The orthogonality of the different OFDM subcarriers can also be demonstrated in another way. According to (2.1), each OFDM symbol contains subcarriers that are nonzero over a T-second interval. Hence, the spectrum of a single symbol is a convolution of a group of Dirac pulses located at the subcarrier frequencies with the spectrum of a square pulse that is one for a T-second period and zero otherwise. The amplitude spectrum of the square pulse is equal to $\mathrm{sinc}(\pi f T)$, which has zeros for all frequencies f that are an integer multiple of $1/T$. This effect is shown in Figure 2.2, which shows the overlapping sinc spectra of individual subcarriers. At the maximum of each subcarrier spectrum, all other subcarrier spectra are zero. Because an OFDM

receiver essentially calculates the spectrum values at those points that correspond to the maxima of individual subcarriers, it can demodulate each subcarrier free from any interference from the other subcarriers. Basically, Figure 2.3 shows that the OFDM spectrum fulfills Nyquist's criterium for an intersymbol interference free pulse shape. Notice that the pulse shape is present in the frequency domain and not in the time domain, for which the Nyquist criterium usually is applied. Therefore, instead of intersymbol interference (ISI), it is intercarrier interference (ICI) that is avoided by having the maximum of one subcarrier spectrum correspond to zero crossings of all the others.

The complex baseband OFDM signal as defined by (2.2) is in fact nothing more than the inverse Fourier transform of N_s QAM input symbols. The time discrete equivalent is the inverse discrete Fourier transform (IDFT), which is given by (2.4), where the time t is replaced by a sample number n. In practice, this transform can be implemented very efficiently by the inverse fast Fourier transform (IFFT). An N point IDFT requires a total of N^2 complex multiplications—which are actually only phase rotations. Of course, there are also additions necessary to do an IDFT, but since the hardware complexity of an adder is significantly lower than that of a multiplier or phase rotator, only the multiplications are used here for comparison. The IFFT drastically reduces the amount of calculations by exploiting the regularity of the operations in the IDFT. Using the radix-2 algorithm, an N-point IFFT requires only $(N/2)\cdot\log_2(N)$ complex multiplications [1]. For a 16-point transform, for instance, the difference is 256 multiplications for the IDFT versus 32 for the IFFT—a reduction by a factor of 8! This difference grows for larger numbers of subcarriers, as the IDFT complexity grows quadratically with N, while the IFFT complexity only grows slightly faster than linear.

$$s(n) = \sum_{i=0}^{N_s-1} d_i \exp(j2\pi \frac{in}{N}) \tag{2.4}$$

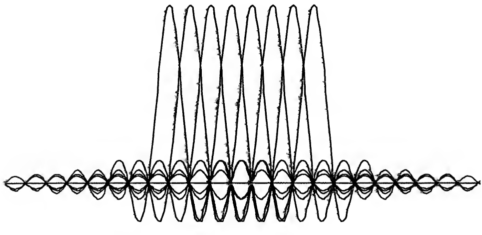

Figure 2.3 Spectra of individual subcarriers.

OIPE JCG98 JUL 06 2005 PATENT & TRADEMARK OFFICE

IFW

Applicant(s): McCallister, et al. Group Art Unit: 2637

Serial No.: 10/718,507

Examiner: CORRIELUS, Jean B.

Filed: November 19, 2003

For: CONSTRAINED-ENVELOPE DIGITAL-COMMUNICATIONS TRANSMISSION SYSTEM AND METHOD THEREFOR

INVENTOR'S SUBMISSION UNDER 37 C.F.R. 1.56

I, Ronald D. McCallister, a named inventor in the above-identified reissue application, make the following disclosure pursuant to my obligation under 37 C.F.R. 1.56 to make known to the Patent Office any information that refutes or is inconsistent with a position the applicant takes in asserting an argument of patentability. I am not currently affiliated with the assignee of the application and have no interest in the application.

My disclosure concerns the May et al. prior art reference[1], which is of record in the application.

All of the pending claims of the application recite either a delay element or delaying step. The applicant argued that the May reference "does not discuss or suggest a delay element or delaying step" (Preliminary Amendment, November 19, 2003). It has come to my attention that the pending claims have been allowed based on the applicant's characterization of the May reference as not requiring that the signal be delayed. I respectfully disagree with the applicant's characterization.

The May paper teaches that you must identify the instant in time in which a signal peak occurs, and then subtract a scaled version of a fixed pulse-shape from the input signal, where the peaks of the pulse-shape and the signal have been time-aligned[2]. Since the pulse-shape extends in both directions in time from the point at which its peak occurs, the teaching clearly requires that the input signal is delayed by at least half of the pulse-shape duration. In view of the foregoing, it is clear that May's approach inherently uses a delay; in my opinion it cannot be done any other way.

The following Figure 1 graphically depicts the necessity for signal delay in implementing May's teaching.

[1] T. May and H. Rohling, "Reducing the Peak-to-Average Power Ratio in OFDM Radio Transmission Systems," published May 18, 1998 in the Proceedings of the 1998 Vehicular Technology Conference, pp. 2474-2478.
[2] Ibid, p. 2475, col. 2, lines 39 -41 (the three equations at the bottom of the second column).

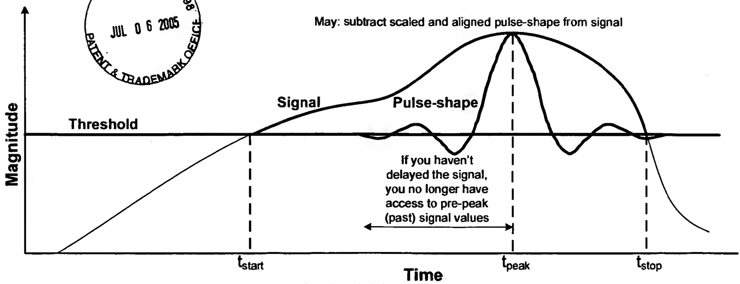

Figure 1. Need for signal delay to follow May's teaching

Figure 1 shows signal magnitude over a time interval. At time t_{start} the signal magnitude exceeds the defined threshold, and this condition persists until the signal magnitude once again drops below that threshold at time t_{stop}. The signal magnitude exhibits a peak at time, t_{peak}. May clearly teaches that the scaled bandlimited pulse-shape must be time aligned so that the pulse peak and the signal peak are time-coincident[3], the scaling defined so that the magnitude of the difference between the signal and the pulse equals the threshold at that peak instant[4]. May then clearly instructs that the scaled and aligned pulse values must be subtracted[5] from the corresponding signal values. It is impossible to follow May's teaching without the use of signal delay. In order to subtract pulse values from signal values, all required signal values must be accessible. However, at that point in time (t_{peak}) when this subtraction action is prescribed, all the signal values in the past (left of the peak instant) have already occurred. To follow May's specific instructions to subtract pulse values from ***all*** (to both sides of the peak instant) corresponding signal values, delay must be used to make sure that past signal values are still available.

Respectfully submitted,

Ronald D. McCallister
7701 E. Onyx Ct.
Scottsdale, AZ 85258-1135
(480) 998-3208

Dated: July 5, 2005

[3] Ibid, p. 2475, col. 2, lines 40 -41 (the last two of the three equations at the bottom of the second column).
[4] Ibid, p. 2475, col. 2, lines 41 (the last of the three equations at the bottom of the second column).
[5] Ibid, p. 2475, col. 2, lines 39 (the first of the three equations at the bottom of the second column).

IFW

Applicants	McCallister, et al.		
Serial No.:	10/718,507	Group Art Unit:	2637
Filed:	November 19, 2003	Examiner:	CORRIELUS, Jean B.

For: CONSTRAINED-ENVELOPE DIGITAL-COMMUNICATIONS TRANSMISSION SYSTEM AND METHOD THEREFOR

INVENTOR'S SUBMISSION UNDER 37 C.F.R. 1.56

I, Ronald D. McCallister, a named inventor in the above-identified reissue application, make the following disclosure pursuant to my obligation under 37 C.F.R. 1.56 to make known to the Patent Office any information believed material to the issue of patentability or that refutes or is inconsistent with a position the applicant takes in asserting an argument of patentability. I am not currently affiliated with the assignee of the application and have no interest in the application.

Initially, the Examiner's acknowledgement of my prior submission dated July 6, 2005 is appreciated. In light of a further position taken by the applicant, I believe it necessary to make this further submission pursuant to my disclosure obligation.

My disclosure concerns the May et al. prior art reference ("Reducing the Peak-to-Average Power Ratio in OFDM Radio Transmission Systems," published May 18, 1998 in the Proceedings of the 1998 Vehicular Technology Conference), which is of record in the application.

All of the pending claims of the application recite either a linearizer or linearizing limitations (Note: the dependency of claims 43 and 44 appears to be incorrect but are assumed to correctly depend from a claim reciting a linearizer or linearizing limitations). In an Office Action dated November 29, 2005, the Examiner stated that "applicant representative admitted that May et al. teaches every feature of the claimed invention but does not teach the inclusion of a linearizer or linearizing limitations in all the claims either directly or through dependency." The Examiner was referring to applicant's remarks in a Preliminary Amendment dated November 19, 2003. In an Amendment dated May 30, 2006, the applicant took issue with the Examiner's November 29, 2005 statement. The basis for applicant's disagreement with the Examiner's statement is not readily apparent.

However, irrespective of the applicant's current position, I believe the present characterization of May as not describing a linearizer or linearizing limitations may not be accurate.

The May reference states:

> "In most of the publications about amplitude limitation of OFDM signals it is assumed that it can be achieved by predistortion of the signal that the amplifier behaves like an ideal limiter. This means that the <u>signal is amplified linearly</u> up to a maximal input amplitude A_0 and larger amplitudes are limited to A_0, see Fig. [1]. Based on this assumption, we also model the amplifier as an ideal limiter with amplitude threshold A_0 in this paper." (P. 1, col. 1) (emphasis added).

Thus, it is my belief that the statement "the signal is amplified linearly," in the context of the May disclosure, would clearly be appreciated by a person of ordinary skill in the art as describing the claimed linearizer or linearizing limitations. In addition, Figure 1 of May, duplicated below, shows linearization up to a maximal input amplitude.

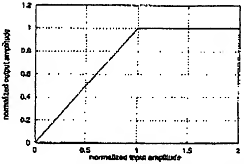

Fig. 1. Ideal limiter with normalized input and output amplitude, maximal input amplitude $A_0 = 1$

Respectfully submitted,

Ronald D. McCallister
7701 E. Onyx Ct.
Scottsdale, AZ 85258-1135
(480) 998-3208

Dated: August 16, 2006

PATENT
Attorney Docket No. 0064-0002RIS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	
Ronald D. McCallister et al.	Group Art Unit: 2611
Application No.: 10/718,507 For: Constrained-Envelope Digital-Communications Transmission System and Method Therefor	Examiner: Corrielus, Jean B
Application No.: 10/718,505 For: Constrained-Envelope Transmitter and Method Therefore	
Filed: November 19, 2003	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

DECLARATION OF PAUL BERNKOPF
UNDER 37 C.F.R. § 1.132

I Paul Bernkopf hereby make the following declaration:

1. I am the Vice President and Assistant Secretary of Intersil Americas Inc., the sole assignee of the above-captioned reissue patent application.

2. I am a registered patent attorney. My registration number is 41,615.

3. On Thursday, August 14, 2003, I received an e-mail from Ronald McCallister, the inventor of the above-captioned application. A true copy of this email is found in Appendix 1. The August 14, 2003, e-mail included a Memorandum as an attachment. A true copy of this Memorandum is found in Appendix 2.

4. In the Memorandum, Mr. McCallister asked "to discuss potential licensing" of U.S. Patent No. 6,366,619 ("the '619 patent") and U.S. Patent No. 6,104,761 ("the '761 patent") for his employer CrestCom. The '761 patent and the '619 patent form the basis of the above-cited reissue patent applications.

5. In particular, the Memorandum dated August 14, 2003, from Mr. McCallister stated:

> We wish to discuss potential licensing of two CERN patents (6,104,761, filed 8/15/00, and 6,366,619, filed 04/02/02) . . . . [A]n exclusive license to CERN might nonetheless be valuable to CrestCom.

See Appendix 2, ¶ 3.

6. Subsequent to Mr. McCallister's August 14, 2003, e-mail and in response to Mr. McCallister's request, CrestCom and Intersil Americas Inc. engaged in discussions related to the licensing of the '619 and '761 patents by CrestCom.

7. Ultimately, Intersil Americas Inc. did not license any rights to the '761 or '619 patents to CrestCom.

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 101 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated:

By: P. Bernkopf
Paul Bernkopf

APPENDIX 1

From: Ron McCallister [mailto:rondonaz@cox.net]
Sent: Thursday, August 14, 2003 4:44 PM
To: Bernkopf, Paul
Cc: Bob Solem; Weaver, Duncan
Subject: Teleconference background

Paul,

The attached memo provides brief background notes for tomorrow's conference call . I look forward to our discussion.

<<PaulBernkopfMemo.doc>>
Regards,
Ron

Ron McCallister
"Si hoc legere scis, nimium eruditionis habes."
<<Ron McCallister.vcf>>

Ron McCallister <ron@crestcominc.com>
President
CrestCom, Inc.

	Content-Description:	PaulBernkopfMemo.doc
PaulBernkopfMemo.doc	**Content-Type:**	application/msword
	Content-Encoding:	base64

APPENDIX 2

To: Paul Bernkopf
From: Ron McCallister
Date: 8/13/03
Subject: Background information for teleconference call on Friday, August 15, 2003

Introduction: Bob Solem and I recently formed CrestCom to develop intellectual property to improve amplifier efficiency when transmitting multiple signals. We have filed for a patent covering our approach, and we do not believe our approach infringes on Intersil's patents for CERN (constrained-envelope root-nyquist) technology. Obviously this point is moot until we see the detailed claims awarded for both CERN technology and ours. Nonetheless, the pending sale of WiFi technology to Globespan Virata prompted us to make Intersil aware of our intentions, and of the potential value that the CERN patents might have. It is in the spirit of cooperation with our former colleagues that we requested this discussion, and we appreciate your making time in your busy schedules to accommodate it.

Strategic Vision: We at CrestCom envision a transition from the current cellular base station infrastructure to a worldwide network of flexible access points capable of serving multiple wireless functions, e.g., cellular telephony, WiFi and WiMAX. CrestCom has focused on developing and patenting signal processing techniques to significantly reduce amplification costs for such access nodes, which must simultaneously transmit multiple signals. We believe our technology to be defensible and we also believe our business model to be capable of supporting margins consistent with Intersil's business model. CrestCom's business model is, in fact, a fabless signal processing semiconductor play. and it has occurred to us that there might be an interest on Intersil's part to work together with CrestCom in ways that go beyond the patent discussions herein. We have two specific objectives: 1) to discuss issues regarding our interest in licensing CERN patents; 2) to share our strategic vision and see whether Intersil's focus on high-margin semiconductor products might motivate potential collaboration.

CERN patents: We wish to discuss potential licensing of two CERN patents [6,104,761, filed 08/15/00, and 6,366,619, filed 04/02/02] and two pending patents [20030063683 and 20030063682, both filed on April 3, 2003]. While we believe that our new approach does not infringe on CERN, an exclusive license to CERN might nonetheless be valuable to CrestCom. Against four CDMA signals, typical peak-to-average-power-ratio reduction approaches offer ~2dB of gain; CERN offers ~3dB; our approach offers ~6dB. Technology-related margins depend on net benefit over competing approaches, so it is as valuable to keep competitors from using CERN as to squeeze an extra 1 dB from our approach. Since our approach provides performance near the theoretical limit, it is more practical to consider licensing CERN than additional R&D. In summary, there are two reasons for us to want to discuss licensing CERN: one to cover patent coverage unpredictability, and the other to increase our competitive advantage.

The value of a patent lies in its ability to restrict use by competitors, so we need to address a key concern over the basic defensibility of the awarded patents. Recently, as I was searching for prior art on behalf of CrestCom, I discovered that Dr. Hermann Rohling published, in May 1998, a precise description of CERN - four months prior to our filing date. Sandra RuI regret not finding this article (which I have faxed to Sandy) during the original CERN searches, but it was disclosed at a conference on Vehicular Technology, not where one usually finds communication advances. Nonetheless, the Conference Proceedings volumes were sent to thousands of libraries, so it clearly constitutes prior art, and might render the single-signal CERN patents unenforceable. We are interested in your opinion. It is also possible that the pending CERN patent filings, multi-signal CERN, will suffer coverage loss as a result of this prior art, and so we may have to await the examiner's conclusions before knowing how valuable the new, multi-signal, CERN patents are. CrestCom intends to move forward in this area, and is interested in licensing multi-signal CERN based on the need to do so as determined by awarded patent claims. We must await the ruling on our own technology regarding CERN as prior art. Regardless of the outcome of the patent issues, there are other possibilities for mutual cooperation that we would like to discuss as well.

RELATED PROCEEDINGS APPENDIX

There is nothing to present in the Related Proceedings Appendix.